REMARKS

Claims 1-22 are pending in the application. With this amendment claims 1-3, 10, 11, 15, and 17-22 have been cancelled, and claims 23-36 have been added with this amendment. All of the claims remaining in the application relate to a polymer composition comprising a chlorine-containing or bromine-containing polymer and an organic thiol compound. Claims relating to organic thiol compounds per se have been cancelled with this amendment.

The specification is objected to on page 4, lines 16 and page 5, lines 1-2 as the Examiner states R^2 cannot be alkyl, but instead has to be an alkene. It is respectfully submitted that R^2 is correct as described. Even though R^2 is substituted with a thiol group, the name of the substituted R^2 would be a mercapto alkyl such as mercapto ethyl. Attached to this amendment is a copy of page 91 from Organic Chemistry by L. G. Wade, Jr., Fourth Edition. The naming of complex alkyl substituents is described at the bottom of page 91. As shown by the four examples, the substituted alkyl group is referred to as propyl or butyl groups respectively even though they are substituted with additional alkyl groups such as ethyl, methyl or the like. Accordingly, it is respectfully submitted that the rejection to the specification and claims is moot.

The specification has also been objected to by the Examiner specifically on page 17, line 27 and on page 18, lines 3, 4 and 15. The Examiner states that R^3, R^4, R^5, R^6 and R^7 cannot be aliphatics or alkyls. The claims have also been rejected under 35 U.S.C. §112, first paragraph for the same reasons as objected to in the specification.

Each R group will be specifically discussed herein. In order to clarify the description of R^3 and R^5 in the specification and the claims, the definition thereof has been amended to state that R^3 and R^5 are alkenyls. The term "alkenyl" properly describes the use of R^3 when x is greater than 1 and R^5 as multi-valent radicals in the structures shown. R^4, R^6 and R^7 are properly characterized as alkyl

groups for the same reason as described above with respect to R^2. Accordingly, the description in the specification and claims regarding R^4, R^6 and R^7 has not been amended. It is respectfully submitted that the Examiner's rejection to the specification and the claims under 35 U.S.C.§112 has been overcome.

Claims 4-18 have been rejected under 35 U.S.C.§112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention. The Examiner states that the term "metal-based" is indefinite and that "metal-containing" is suggested. While it is respectfully submitted that one of ordinary skill in the art understands the term "metal-based" and the same is not indefinite, the claims have been amended as suggested by the Examiner to further clarify the invention. It is respectfully submitted that this objection has been rendered moot by the amendment to the claims.

Claims 1-3 and 19-22 are rejected under 35 U.S.C.§103(a) and 35 U.S.C.§102(b) in view of various references. Inasmuch as these claims have been cancelled, no discussion of the cited references is necessary.

Claims 4-16 have been rejected under 35 U.S.C.§102(b) as being anticipated by Lindsey, U. S. Patent No. 3,242,133, Davenport, U. S. Patent No. 3,652,733, Sakai Chemical Industries, JP-63-241055, or Henkel KgaA DE 32 47 736.

It is respectfully submitted that the cited references cannot teach or suggest the present invention as claimed. Each of the references will be discussed hereinbelow with respect to the pending claims.

The Lindsey reference relates to the stabilization of polyvinyl halide resins utilizing a combination of a terpene compound and a sulfur containing compound which optionally can contain a thiol group. Independent claim 4 relates to a polymer composition comprising a chlorine-containing or bromine-containing polymer and a stabilizer component consisting of an organic thiol compound and optionally epoxidized soybean oil. Accordingly, independent claim 4 excludes

utilizing in combination with an organic thiol the terpene stabilizers disclosed in the Lindsey reference. Thus, it is respectfully submitted that claims 4-16, 23 and 24 are novel in view of the Lindsey reference. There is no teaching or suggestion within the Lindsey reference for the utilization of the specifically claimed organic thiols as a sole stabilizer component, or optionally with the inclusion of epoxidized soybean oil to stabilize a chlorine-containing or bromine-containing polymer. In fact, Lindsey states in column 1, lines 57-70 that the combination of at least one terpene compound and a sulfur-containing compound are used to stabilize the halogenated polymers.

Regarding new claims 25-36, a polymer composition comprising the chlorine-containing or bromine-containing polymer and specific organic thiol compounds containing at least one thiol group and at least two ester groups is claimed. As noted by the Examiner, the Lindsey reference sets forth a laundry list of sulfur-containing compounds, only some of which contain thiol groups. It is respectfully submitted that out of the complete list set forth in column 3, lines 24-42 and the examples, only 2 di-ester containing aliphatic thiols are disclosed. There is no teaching or suggestion within the reference that any of the listed stabilizers can be utilized free of the terpene compound to provide stabilization for a halogenated polymer. Independent claim 25 specifically excludes the di-ester organic thiol mentioned in Example 16 of Lindsey. Moreover, it has been unexpectedly found by the Applicant that aliphatic organic thiols having di-ester groups thereon as claimed, and not just any organic thiol can beneficially act as stabilizers for halogenated polymers and can be used alone. As the Applicant has shown in Example 3 on page 21 the aliphatic thiol, 1-dodecanethiol results in extensive degradation when utilized alone in PVC, yet this organic thiol is suggested for use in the Lindsey reference.

It is respectfully submitted that one of ordinary skill in the art would not be led in the direction the Applicant has taken upon reading the Lindsey reference.

First, there is no teaching or suggestion for utilizing a sulfur-containing organic compound as a stabilizer without utilizing in the synergistic combination with the terpene compounds. Furthermore, the Lindsey reference sets forth an extremely broad group of sulfur-containing organic compounds which can be utilized in combination with the terpene compound. The list of such thiols in column 3, lines 24-42 contains over 30 different thiols. One of ordinary skill in the art would not be led to choose the Applicants' specifically claimed aliphatic di-ester organic thiols.

The Davenport reference relates to thermoplastic polymer compositions containing a polymerizable plasticizer such as diallyl phthalate, and a polythiol. The polythiol as stated in column 2, lines 25-46 is preferably an ester of a thiol-containing acid and a polyhydroxy compound having 2 to 6 hydroxyl groups. As stated in column 1, lines 57-66, the purpose of the polythiol in the composition is to provide crosslinking sites through the reaction of the polythiol with the polymerizable plasticizer to produce thio-ether links. As stated in column 3, lines 12-21 of Davenport, if it is desirable to include a heat stabilizer, generally from 0.5 to 5 weight percent of a metal-based stabilizer such as lead carbonate, lead acetate, etc. is utilized in the polymer composition. Accordingly, independent claim 4 cannot be taught or suggested by the Davenport reference as the claim is limited to a stabilizer component consisting of the claimed organic thiol compounds. Independent claim 25 cannot be taught or suggested by the Davenport reference as none of the claimed organic thiols are taught by Davenport.

The Sakai reference relates to chlorinated polymer compositions which utilize pentaerythritol based thiols as stabilizers. Independent claim 4 has been amended to claim only di-ester organic thiol compounds wherein x is 2 as particularly illustrated by Formulae III and IV on page 18 of the application. Accordingly, the Sakai reference is not pertinent and cannot teach or suggest the polymer composition claimed in independent claim 4. Independent claim 25 is also limited

in the same manner as independent claim 4 and is also novel in view of the Sakai reference.

The Henkel reference DE 32 47 736 relates to PVC molding compositions which are stabilized. The Examiner stated during the interview that it is his position that claim 1 of the Henkel reference anticipates Applicants' claims. The Applicants have carefully studied the complete translation and respectfully argue that Henkel only teaches utilizing a stabilizer combination of a) a primary stabilizer comprising a metal-based stabilizer and b) a secondary stabilizer comprising a mercapto succinate-based organic thiol or an alkyl mercapto succinimide compound, when the reference is read as a whole.

Section 2141.02 of the MPEP states that "Ascertaining the differences between the prior art and the claims at issue requires interpreting the claim language, and considering both the invention and the prior art references as a whole." Furthermore, the last portion of the noted Section includes the heading "PRIOR ART MUST BE CONSIDERED IN ITS ENTIRETY, INCLUDING DISCLOSURES THAT TEACH AWAY FROM THE CLAIMS." The Federal Circuit has further stated "A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention." W. L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984). In *In re Wesslau*, the Court of Customs and Patent Appeals cautioned that "it is impermissible within ...to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." 353 F.2d at 241, 147 USPQ at 393. In Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc., 796 F.2d 443, 230 USPQ 416 (Fed. Cir. 1986), cert. denied, 484 U.S. 823 (1987), on remand, 10 USPQ 2d 1929 (N.D. Calif. 1989), the Federal Circuit held that a single line in a prior art reference should not be taken out of context and relied upon with the

benefit of hindsight to show obviousness. Rather, a reference should be considered as a whole, and portions arguing against or teaching away from the claimed invention must be considered. Moreover, according to Markman v. Westview Instruments, 52 F.3d 967, 979-980, 34 USPQ 2D 1321, 1329 (Fed. Cir. 1995), aff'd, 517 U.S. 370, 134 L. Ed. 2d 577, 116 S. Ct. 1384 (1996), "claims must be read in view of the specification, of which they are a part."

In view of the MPEP and case law presented above, a review of the Henkel reference follows. Beginning with claim 1 relied upon by the Examiner, Henkel discloses stabilized polyvinyl chloride molding compounds containing "at least" the noted succinate-based compounds of Formulas (I) and (II). By utilizing the term "at least," it is respectfully submitted that Henkel is not limiting stabilized molding compounds to include only compounds of Formulas (I) and (II) as argued by the Examiner.

The last three lines at the bottom of page 5 state that the mentioned metal compounds are usually described as primary stabilizers and to improve their effectiveness, secondary or co-stabilizers are frequently added to them.

In the "Background of the Invention" on page 6, bottom of the first full paragraph, Henkel states that there is a need for substances with the assistance of which the initial and/or long term effect of such stabilizer systems (already known) can be decisively improved.

Lines 2 and 3 of page 7 state that it has been found that the mercapto compounds of Henkel are capable of enhancing the stabilizing effect of primary stabilizers, with specific emphasize on the initial stability.

The paragraph beginning at the bottom of page 7 of Henkel states that the stabilized molding compounds also contain a stabilizer combination of 1) primary stabilizers selected from the group consisting of metal soaps, etc. as well as 2) co-stabilizer, characterized in that they contain compounds of Formulas (I) and (II) as co-stabilizers.

Moreover, page 15, second full paragraph of Henkel states in the simplest scenario, the stabilizer combination for polyvinyl chloride molding compounds in accordance with the invention is comprised of a primary stabilizer which is selected from the group which consists of metal soaps, aromatic metal carboxylates and metal phenylates, and a compound of Formula (I) or (II).

The third and fourth paragraphs of page 16 states that the stabilizer combinations in accordance with the invention may contain other ingredients.

Further support for Applicants position is found in the Example section wherein every example utilizes a stabilizer combination of a metal-containing stabilizer as well as a succinate-based organic thiol compound. Examples A-F all contain calcium stearate and zinc stearate in combination with the organic thiol, see especially Table 1. In Example 2, examples G-L all contain calcium stearate. Examples I, J, and L additional contains sodium aluminum silicate. Please see Table 2 also. Finally, Example 3 utilizes a combination of zinc stearate and barium stearate as metal-based stabilizers in the stabilizer combination.

It is respectfully submitted that claim 1 cannot be solely interpreted as the Examiner suggests and that Henkel was not in possession of the Applicants invention as claimed wherein the polymer composition includes a heat stabilizer component consisting of only an organic thiol, or an organic thiol as a stabilizer component which is free of a metal-containing stabilizer. If Henkel was in possession of Applicants' invention, at least one of the examples would have utilized the succinate-based organic thiols independently of a metal-containing stabilizer. According to statute as well as the case law, the Henkel reference, when taken as a whole, from the weight of the evidence presented cannot teach or suggest Applicants' claimed invention.

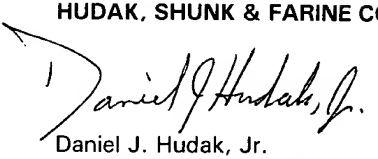
Accordingly, the Henkel reference cannot teach or suggest the polymer composition claimed in independent claim 4 wherein a chlorine-containing or bromine-containing polymer is stabilized by a stabilizer component consisting of the

specifically claimed organic thiol. Moreover, independent claim 25 cannot be taught or suggested as it is claimed that the polymer composition is free of a metal-containing stabilizer.

It is respectfully submitted that in view of the fact that the independent claims cannot be taught or suggested by the cited references, the dependent claims thereof are also allowable. It is respectfully submitted that the claims are in condition for allowance and a notice of such is earnestly solicited.

Respectfully submitted,

HUDAK, SHUNK & FARINE CO. LPA



Daniel J. Hudak, Jr.
Registration No. 47,669

2020 Front Street, Suite 307
Cuyahoga Falls, OH 44221
Telephone 330-535-2220

Attorney Docket No.: EP-1020-CIP